FO OUTLOOK
NASA AMES RESEARCH CENTER

Information for the NASA Ames Aeronautical Test & Simulation Community

September 21, 2000

DEHAVILLAND DASH 8 TURBOPROP PASSENGER PLANE

TO BE TESTED IN THE 80X120

By Steve Buchholz

The Dehavilland Q400 Dash 8 (The Quiet One) Twin-Turboprop Airliner

This past week you might have looked out your office or car window and seen a 107-foot long twin engine passenger plane rolling down the road. We hope you did not panic, it was just a Dehavilland Dash 8 wheeling its way to the 80x120 for a crosswind test. What makes this test so unusual is the aircraft will actually be piloted in the test section with the tunnel main drive on and aircraft engines running.

The Q400 Dash 8 *(The Quiet One*) is the latest in the series of Dash 8 aircraft built by Dehavilland of Ontario, Canada. Some of you may have flown on one of the Dash 8 series for local short commuter flights. The current version is predominately flown in Europe and is not seen in the United States very often. It has been stretched to carry 70 passengers to an altitude of 25,000 Ft, at a cruise speed of 350 knots and with a range of 1,310 nautical miles. The aircraft is equipped with two identical turbine Pratt and Whitney Canada PW 150A engines with a sea level static power ratings of 4580 SHP (Normal Take-Off Power) and 5071 SHP (Maximum Take-Off Power). Each turbine drives a 13.5-foot diameter variable pitch propeller through a reduction gearbox. Each propeller consists of 6 composite blades that spin at a nominal speed of 1020 RPM. The Q400 is also equipped with a revolutionary new system that dramatically reduces cabin sound and vibration. Microphones concealed throughout the cabin transmit noise information to a special on-board computer that also receives propeller speed. The computer continually analyzes this information and signals devices on the fuselage frames to produce out-of-phase

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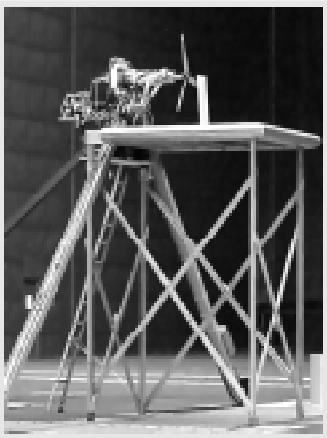
TILTROTOR DESCENT AERODYNAMICS TEST

By Mark Betzina

IN THE 80X120 FT WIND TUNNEL



Tiltrotor Descent Aerodynamics Test in the 80- by 120-Foot Wind Tunnel.

The Aeromechanics Branch of the Army/NASA Rotorcraft Division initiated the Tiltrotor Descent Aerodynamics program after learning that the recent crash of a V-22 tiltrotor aircraft may have been caused by operating in a "vortex ring state." High rates of descent at low forward speeds produce high rotor tip-path-plane angles-of-attack. At these high angles-of-attack, a rotor can enter a vortex ring state when the freestream flow velocity approaches the rotor induced wake velocity. This results in high vibration, thrust loss, and ineffectiveness of collective blade pitch to change thrust. This can be very dangerous to a rotorcraft because the descent rate accelerates and increasing power may not be sufficient to slow the descent. This condition is usually avoided in flight by limiting descent rate at low forward speeds. However, the phenomenon is not well understood, and very little research has been done to define the safe operating boundaries for helicopter rotors. Even less is known about tiltrotors in this state, which probably behave differently than helicopter rotors because of their higher disk loading and blade twist, as well as rotor/wing and rotor/rotor interactions.

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EVERYTHING YOU WANTED TO KNOW ABOUT ELECTRICITY FOR THE WIND TUNNELS

By Tom Aiken

"... $1500 for every test- hour."

This article reviews our present situation with Ames' electrical power supply, the State of California deregulation, and Ames' electrical future.

Why should you care and why should you understand electrical power? Electric power is an important and significant customer cost, especially in the Unitary where "wind on" electric power costs can be $1,500 for every test occupancy hour. A well-informed staff with a good understanding of electric power can minimize customer costs and make us more competitive.

Definitions:

Power is the instantaneous demand that an electrical device pulls from a supplier. The Unitary has a maximum power demand of 178 Megawatts (MW's) enough to supply a town of 80,000 people. The NFAC can draw 106 MW's and the 12 Foot, 12 MW's.

Integrated Demand is the average Power used over a 30-minute period beginning each half-hour. For example, running at 160 MW's for 15 minutes and 0 MW's for the remaining 15 minutes results in an average Integrated Demand of 80 MW's.

Energy is the integration of Power over time. For example, two hours spent at a Power level of 80 MW's would result in Energy use of 160 Megawatt Hours (MWHr's).

While most people understand Power, what we actually pay for is Integrated Demand and Energy.

Current Electrical Users and Suppliers:

Ames has two users and two Power suppliers. The two users are Ames' Buildings and Ames' Wind Tunnels. Buildings draw a fairly constant level of power between 20–25 MW's and wind tunnels can draw up to 200 MW's, but only for short periods. These peak power requirements make Ames a unique Energy customer to our two Power suppliers. The first, Western Area Power Administration (WAPA) provides Ames' first 80 MW's of Integrated Demand, and the second, Pacific Gas and Electric (PG&E) provides the Wind Tunnel Integrated Demand above the total WAPA 80 MW capacity.

Our suppliers provide different types of power and have very different costing structures. WAPA provides hydroelectric power and charges us over $5,400 per MW for our highest Integrated Demand. PG&E has a variety of power sources with an inexpensive, $350 per MW Integrated Demand. On the surface, using a lot of PG&E's power at an inexpensive Integrated Demand looks appealing, however Energy costs create a different story.

Energy costs are just the opposite for those of Integrated Demand. WAPA Energy costs are consistent at about $10 for every MWHr regardless of time of day. PG&E Energy costs vary hourly each day from $30 per MWHr in the early morning to $100 per MWHr in the middle of the afternoon. On especially hot days, mid afternoon costs can be as high as $1,600 per MWHr!

The Buildings pull a steady Integrated Demand of 20-25 MW's, 24 hours/day, 7 days/week with a consistent energy consumption of about 9,000 MWHr's a month. The Wind Tunnels run very sporadically and some days not at all. The Wind Tunnels typically use 6,000 to 7,000 MWHr's a month (somewhat less than the Buildings) however; the Wind Tunnel Integrated Demand may be ten times more than the Buildings.

Combining Building and Wind Tunnel usage would show a steady base with sporadic tall, narrow spikes, or low Energy usage with high, sporadic Integrated Demand. This unpredictable use of Energy would make Ames an unattractive customer if it were not for our ability to move large Wind Tunnel Integrated Demands to different shifts thereby avoiding other California customer's high demand periods. As an example, we avoided running from Noon to 8 PM this past summer when the statewide electrical supply was strained.

Bottom lin

We use two strategies to keep the cost of power as low as possible. First, is to maximize the use of WAPA energy. Second, is to run high power at times when PG&E energy costs are at the lowest (away from the noon to the 8PM period). By maximizing the use of WAPA energy, a WAPA MWHr can be reduced to around $35/MWHr or three and a half cents per KWHr. By running when PG&E costs are reasonable, we have kept their average costs at $130/MWHr for the past two years.

What the Future Looks Like:

The one constant we can expect in the future is for everything to change. WAPA power is not currently affected by California deregulation although their power is transmitted on power lines owned by PG&E and operated by the Independent System Operator (ISO). There is a remote possibility Congress may privatize the smaller Federal power agencies like WAPA. If they do we may see significant WAPA price changes when our contract with WAPA is renewed the end of 2004. In any event of, WAPA may have a difficult time continuing to honor their supply of Ames' 80 MW's (regardless of the time of day or year) on days the state's electrical system is strained with high demand.

(Continued on page 5)

TPS BATHTUB *By Jim Strong*

The objective of this test was to evaluate and validate the integrity of Thermal Protection System (TPS) materials for next generation reusable launch vehicles including X-37. Conformable Re-usable Insulation (CRI) is a next generation, atmospheric re-entry vehicle insulation material composed of glass ceramic fabric and batting materials. It follows in the line preceded by the AFRSI and TABI insulation designs and is used to insulate 'moderate' heating areas of re-entry vehicles.

The wind tunnel test simulated a worst case aerodynamic loading as determined by existing space shuttle (SSV) ascent flow field data. The object or success criteria for a test panel was to survive 42 minutes of test conditions above 400 pounds per square foot dynamic pressure without showing any degradation, breakup of surface material, or stitching. Entry of these test articles into the 11-FT. TWT (Transonic Wind Tunnel) will be bracketed by Arc Jet (Bldg. N-238) testing at 2000 °F for ten minutes to simulate the re-entry phase. These entries equate to a prescribed number of earth launches and re-entries (100).

This effort was conducted as part of Ames' contribution with industry on further development and testing of TPS systems in support of next generation launch vehicles. This particular round of tests was conducted for the Boeing Advanced Thermal Management System group under contract with NASA, Marshall Space Flight Center. Four test panels were tested between July 17 and August 4, 2000.

96-0 Fixture "Bathtub" in 11FT Test Section

The 11x11-foot wind tunnel test completed on July 27, after all four test specimens had been run. Some difficulties were encountered while attempting to get the test articles mounted inside the 96-0 test cavity. Build up and manufacture of the 'close-out' pieces was essentially initiated and completed in the tunnel for each of the test articles consuming a majority of the test time. The first three specimens lasted the entire duration with little noticeable degradation in outer coating and no impact at all on the outer stitching. The fourth test specimen however failed after approximately 19 minutes of test time. This result was somewhat expected, as this design was not as robust as the previous three.
The test articles were photographed and then sent back over to the Arc Jet Panel Test Facility for one to two more hot plasma simulations. All three panels survived these heating tests that should effectively qualify these configurations for vehicle application.

Boeing was happy with the results and gave Ames very good marks on the post -test evaluations.

DEHAVILLAND DASH 8 TURBOPROP PASSENGER PLANE... *(Continued from page 1)*

The aircraft was flown into Moffett Field and was returned to flight status upon completion of the test. Therefore, very few modifications were made for installation into the test section. This particular plane has dry and water ballast to control the center of gravity (CG). Before moving from the airfield, all ballast was be removed. The fuel was removed from the tanks, then they were purged and sealed. Work was done to clear the pathway to the tunnel. Some roadway areas required fill to provide a solid footing. After a leisurely roll from the landing strip to outside the test section doors, a special crane rigging was attached to three 'jacking points' on the plane. Ballast was re-installed to help position the CG precisely so that the craft could be lifted in a level plane with no additional stress applied to the structure. The entire plane was lifted as a unit into the test section. The aircraft was secured to the tunnel turntable in a fashion that simulated normal taxiing conditions. JP-8 fuel was supplied to the engines via the 80x120 fuel system.

Dash 8 being lifted into 80 X 120

The test conditions simulated cross winds from 20 to 70 knots at various yaw angles and test engine power settings that would normally be used during taxiing operations. Since there were men aboard the test article (aircraft), safety was of key concern. Escape routes, fire protection and emergency procedures were defined, approved and practiced before any air on testing was initiated. These procedures were developed with the consultation of a known expert in indoor aircraft testing. His background included operating full size jet aircraft at afterburner power settings inside a test chamber. The primary purpose of this test was to measure dynamic loads on the composite propeller blades. With positive results from this test, the aircraft's current wind ground speed operating envelope would be able to be increased beyond the present 45 knot wind speed limit. The strain gage outputs were monitored and recorded in real-time with an onboard computer data system. No aircraft data passed to the facility data system except the recording of tunnel conditions. The whole test took only three days of running in the tunnel. Upon completion of the test matrix the aircraft was removed from the test section and rolled back to the airstrip to be refitted and fueled for flight.

The successful completion of this test will increase the possibility of similar future programs in the 80- by 120-Foot Wind Tunnel. These programs provide data required for evaluating and improving air vehicle ground handling abilities.

BOEING 777 AT THE 11 FT TWT *By Joel Hoffman*

The test article is a 0.037 scale Boeing 777 airplane configuration.

Following the Unitary Modernization effort and prior to bringing the facility back to a test operational status, Code FO performed two validation tests designed to check out wind tunnel test operations and data quality for the 11Ft Transonic Wind Tunnels (TWT). Data from the "baseline" pre-modernization test and data from the Boeing BTWT facility will be compared to the data from these two validation tests. The test article, instrumentation, and analysis of the data is a cooperative effort by NASA Ames and Boeing Company who will each independently evaluate the effects of the modernization effort.

The test article is a 0.037 scale 777-airplane configuration, instrumented with nine chord wise rows of pressures. All rows have 33 ports, (21 upper surface and 12 lower surface.) In addition, the model has ten cavity pressures and six nacelle pressures. The model will be mounted to the 11-Ft TWT SMSS (Sting Model Support System) using the Ames 20" Unitary Taper extension, the 1542 sting model adapter, and the Boeing 1860-10 upper swept strut blade sting.

The model's force and moments were measured using a Boeing's six-component balance. The balance also include four platinum resistance thermometers. The model had five angle sources for computing five model angles of attack. Three of the sources are from model mounted QA2000 accelerometers, one from a base mounted QA2000 accelerometer, and one from the SMSS knuckle-sleeve position encoders. The Boeing QA2000 accelerometer are the primary angle source. The model was also instrumented with two-wing root bending gages. RMS data was acquired from the two root bending gages as well as the six balance gages.

NASA Ames primary objective was to compare test data results acquired prior to the Ames 11-Ft TWT shutdown. This provided an indication of the effects on model data resulting from the Unitary 11-FT TWT modernization project. Additionally, NASA Ames obtained experience in the installation and operation of the renovated wind tunnel facility. This provided a gage of operational efficiency with a wind tunnel test customer.

The Boeing Company will evaluate the NASA Ames 11-FT TWT relative to parameters, which are important to understanding the capabilities and data quality of the facility. These parameters include operating capabilities of the facility, absolute and incremental data levels relative to data from a baseline facility within series and within test data repeatability, and a "production" test environment measurement of tunnel productivity.

The validation test not only measured the effects of the Unitary Modernization Project, but provided a necessary step in returning the tunnel to operational status. Typical activation problems were identified and massaged out as the 11ft Wind Tunnel was returned to its World-class reputation.

TILTROTOR DESCENT AERODYNAMICS TEST... *(Continued from page 1)*

The initial experimental component of this program was a low-cost, short-term, small-scale test in the 80- by 120-Foot Wind Tunnel. The test objectives were to quantify rotor performance characteristics at high tip-path-plane angles-of-attack, including the wing effect. Vortex ring state was investigated over a wide range of thrust levels, airspeed, and tip-path-plane angles. Smoke flow visualization was used to gain an understanding of the global flow field. The Army's ARTS test rig was used with an existing four-foot diameter tiltrotor. The test incorporated a semi-span wing and an image plane. The Ames Model Shop fabricated the 10.5% scale V-22 wing and flap. Turntable yaw was used to produce varying angles of attack at low airspeeds to simulate a range of descent rates. The test operated on swing shift from July 17th through August 11th. All test objectives were achieved and preliminary results indicate that the data are high quality.

The Navy, Bell Helicopter, and the Boeing Company are all very interested in our test results because they provide new information about tiltrotors at high descent rates that previously did not exist. These results will be used to further the understanding of vortex ring state, to validate analytical models, and to define the objectives of a second test planned for September 2001. Modifications to the Tilt Rotor Aeroacoustic Model (TRAM) to allow future high angle of attack studies are also being considered.

FO OUTLOOK

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ELECTRICITY FOR THE WIND TUNNELS *(Continued from page 2)*

Ames Substation

Deregulation will greatly affect our power supply from PG&E. Before deregulation, public utilities were "vertically integrated" performing power generation, transmission and distribution. Energy and Integrated Demand costs were negotiated between the companies and the State Public Utilities Commission. With deregulation, the State of California created two new organizations to set rates and handle transmission. The Power Exchange (PX) sets rates by becoming a free market broker between sellers and buyers of power. Independent System Operators transmit power over lines at or above 115 thousand volts even though the utilities (like PG&E) still own the lines. Former utility companies continue to distribute and sell power over their lower distribution systems (lines under 115 thousand volts). Power generators within state or out-of-state sell power through the PX using ISO transmission lines and utility distribution lines, paying a transmission and distribution fee to each.

The State's "transition time" to complete deregulation ends in March 2002, giving major utilities time to sell off and capitalize their power generation capabilities (typically nuclear power plants). The State has lowered and fixed consumer costs by ten percent for the duration of the transition period.

Early transition by the San Diego Gas & Electric Company has highlighted some problems for its customers. High demand has driven PX market prices to where customer's bills have more than doubled! This is causing California to reconsider the path of deregulation, the transition end date and other deregulation features.

Ames contract with PG&E remains in place until the transition end date. Presently, negotiations for the new deregulation contract with PG&E discuss Energy costs that are close to the PX price. There is also a requirement that Ames request permission to use power from Noon to 8 PM between the months of May and October.

You may have heard the terms, Stage 1, 2 or 3 Electrical Emergencies. These are called by the ISO when the power demand gets within 7%, 5% and 1.5%, respectively, of the statewide power supply. This past summer Ames had one Stage 3 emergency and a number of Stage 1 and 2's. More and more, we experience Stage 2's on moderate temperature days simply because California's power demand is growing faster than it's supply. It is our policy to run the Wind Tunnels during a Stage 2 only if the Power level required is very low.

One last point, some have asked why we don't buy power from a supplier other than PG&E? The primary reason is scheduling. The PG&E power grid is large enough to easily absorb or deliver our unique power demands. Any other supplier would currently require us to schedule and buy power ahead of the time before use. Under the new rules, unless we found another buyer, we would pay for the power even if we did not use it. With our difficulty in predicting exactly when we are going to run, PG&E is currently the only supplier that can meet our needs.

MODEL PREPARATION ROOM PROJECT *By Dan Petroff*

Two new model preparation rooms are being planned for the Unitary Wind Tunnels with construction starting in 2003. These rooms will replace the existing rooms located in 150B-G. The rooms will be larger and better equipped to take into account the requirement to completely assemble and checkout the models before transporting it to the test section. The Construction of Facilities program is funding these new rooms, providing the entire infrastructure capability. The FO Division will provide instrumentation and instrument wiring.

Model preparation rooms are a necessity for the efficient use of our wind tunnels significantly reducing the cost to the customer. A well-equipped model preparation room allows the customer to completely assemble and checkout a model outside the wind tunnel test section. This includes using a very small subset of the crew that would operate the wind tunnel. Hence, the lower cost. Once the model is ready, it is transported complete with the sting to the test section where it is attached to the model support. With quick checks of the instrumentation, electrical and pressure hookups the tunnel is ready to run.

THE WIND TUNNEL CONNECTION *By John Allmen*

There is a new tool on the Internet that is worth a visit. The Wind Tunnel Connection web site (http://www.worthey.net/windtunnels) is being developed (by mike.worthey@lmco.com) to integrate wind tunnel capabilities, reports, discussion forums and other aeronautical related web site links at both a national and international level. The web site has many features including hot links to supporting web sites and a newsletter with articles from various wind tunnel testing organizations.

"This website has been established as an informational tool for aerospace professionals. Our goal is to build a site containing useful information for engineers engaged in the design, testing and fabrication of aerospace vehicles, hardware and software. As we build this website please feel free to make suggestions. We hope that the information in this site proves useful."

Mike Worthy is accepting any and all pertinent information to expand the effectiveness of this tool. Please contact John Allmen with any information you feel is pertinent to incorporate in The Wind Tunnel Connection including any news articles you may want to submit.

VPP - IS IT JUST ANOTHER ACRONYM? *By Scott Nikodym*

During the past few months, the number of discussions at management levels about VPP has increased substantially. At this point, you may be asking yourself: What is VPP? Where did it come from? What does VPP mean to us as a Division and as individuals? VPP is the acronym for the Occupational Safety and Health Administration's (OSHA) Voluntary Protection Program. OSHA implemented the VPP in the early 1980's to encourage employers to implement and maintain outstanding occupational safety and health programs. OSHA recognizes and rewards employers who have developed outstanding programs that meet the stringent VPP criteria and can demonstrate effective implementation, by awarding either the VPP Star or Merit Designation. OSHA confers the Star designation upon employers who have mature, fully implemented programs, and the Merit Designation, as a "stepping stone," to those employers who have implemented exemplary programs, but may not yet have met all of the VPP criteria.

The VPP has four primary elements that include Management Commitment and Employee Involvement, Worksite Analysis, Hazard Prevention and Control, and Safety and Health Training. Each of these elements has a number of sub-elements that identify specific expectations employers must meet to satisfy the VPP requirements.

In 1999, the NASA Administrator, Daniel S. Golden, announced his desire to have all NASA Centers apply for and obtain the VPP Star designation. TypicallyVPP recipients generally demonstrate improved morale, injury rates that are well below national averages, and a high level of pride and accomplishment. These are all characteristics that the Administrator wishes to encourage the NASA workplace through VPP participation. The NASA Centers, including Ames, have begun safety and health program reviews and planning for changes that will precede their application submissions for consideration as VPP sites. The first such review, performed by NASA Headquarters, occurred at Ames in June. The Center will formally announce its intention to apply for participation in VPP during Safety Week in October.

Where does the FO Division stand on VPP? At this point, the FO Division is probably a bit ahead of the rest of the Center in implementing program elements that meet VPP requirements. Work began on the Division's joint Safety Plan (***http://pubsgroup/FO_Docs/Safety.html***) shortly following the contract transition in December 1998. The plan is based on the four primary VPP elements, which provides an excellent foundation upon which to build a comprehensive safety and health program. During the last 12 months the Division made substantial progress toward implementing the Safety Plan, but still has a long way to go before it will withstand the scrutiny of OSHA's VPP evaluators. Over the next 12 to 18 months many of you will be directly or indirectly involved in activities that will prepare the Division to support the Center's VPP application. These activities may involve participating in the development of safety standards safety training, safety committees, area inspections, and the correction of identified hazards. Look for future articles in the FO Outlook for more information about VPP and progress toward the Center's VPP application.

RICHARD MILLINGTON MEETS UP WITH DAN BUFTON *By Cheryl Der*

You may have seen Richard Millington and Dan Bufton in the hallways of building 227. It is a little-known fact that they shared some history way back in 1969! Here is their story.

(Dan Bufton and Richard Millington)

Richard was attending Sacramento City College at age seventeen when he decided to take some time off and adventured a move to San Jose. He applied for a bus-boy position at Manning's Coffee Café in Valley Fair Shopping Center. Little did Richard know that he was going to meet Dan Bufton!

At the same time, a buff young Bufton was attending San Jose State University majoring in Mechanical Engineering. The twenty-year old Dan was working to support his college education as a dishwasher at Manning's Coffee Café!

Richard and Dan became a dynamic duo. Richard had the "glory job", dressed in a gold bolero jacket, black bow tie, black slacks and a white shirt. He would bus the 85 tables in the restaurant and load the dishes onto a conveyer belt. Back in the steamy kitchen was Dan in his functional white apron, industriously washing up the dishes. Between the two, they kept Manning's operations running smoothly.

One of Richard's vivid tales of the kitchen is when a young female co-worker at the café opened a tub of flour. She began frantically screaming upon finding a dead rat on top of the flour. While she continued shrieking in shock, the café manager came to the rescue — he simply scooped out the rat and all of the surrounding flour and kept all of what was left in the middle to the bottom of the tub! The manager said, "Here you go! Use that flour." as he quickly ran out of the kitchen to another problem. (Manning's no longer has a restaurant at Valley Fair…)

When Richard was leaving Manning's, he had his last chat with Dan Bufton. Richard told Dan he was going to go back to college and Dan said to him, "Then you will be able to answer the question, Is there life after matriculation?"

Richard completed his college education at UC Berkeley. Later in 1984 he came to work at NASA, hired by Informatics, the predecessor to Sterling Software. The contract has changed companies over the years and is currently under Sverdrup. *(Continued on page 7)*

RICHARD MILLINGTON MEETS UP WITH DAN BUFTON

(Continued from page 6)

Dan Bufton started working at Kennedy Jenks as a contractor to NASA in 1988. (Human Performance Research Laboratory and the Automated Sciences Research Facility.) He became a civil servant in 1991 and moved up to become Deputy Chief of the Wind Tunnel Operations Division.

One day, Richard came across an e-mail message addressed to him along with many others. He noticed one of the addressees was a Dan Bufton, but Richard wasn't sure if this was the Dan Bufton from Manning's Coffee Cafe. Eventually Richard had occasion to go down to the construction trailers to speak to the Wind Tunnel Manager of Reconstruction and it just so happened to be Dan Bufton!

Surprised and astonished to see each other, they reminisced on Manning's Café and caught up with all of the changes in their lives. Now when Richard is asked, "Is there life after matriculation?" he can safely answer "Yes."

Employee of the Month Awards

ADAM JACKSON

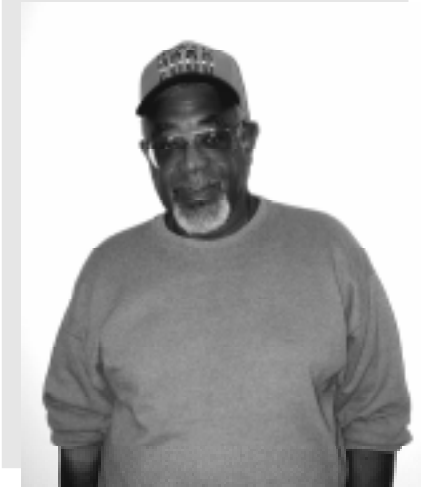
Adam Jackson is a Computer Systems Technician with the Computations Group, supporting the Wind Tunnel Support Branch of the Sverdrup ATOM Contract. His current assignment is helping to resolve complex data problems, achieving higher Mach numbers at high Angle of Attack. Using the test requirements for the Supersonic Sting Blockage Evaluation Test, Adam developed data requirements, operational scenarios, and run schedules that produce optimum data for post test analysis. Adam's test data suite assists in the investigation of solutions for test section exit blockage that may be preventing the 11-Ft from achieving higher Mach numbers (M > 1.2) at higher Angles of Attack. Additional work includes the development of new test dependent equations, collecting IST compressor probe port correlation data, establishing corrections and standard names for the Standard Data System, Facility Control System program downloads and correction interfaces.

Adam takes a customer service approach to his work and has learned to anticipate what the customer will need by providing the analysis and test results before customers request it. His technical abilities allow him to work effortlessly across various hardware and software platforms. His ongoing study of aeronautics has given him a unique understanding of flight testing objectives giving him the ability to converse with engineers, helping them with solutions for aeronautical problems and other concerns including troubleshooting data within the acquisition system, accurately suggesting solutions to mathematical problems. His ability to do all this comes from his joy and dedication to his work and to the people he associates with in the wind tunnels. He is a good mentor, well liked and respected among his peers, who frequently seek him out for his insights, opinions, and humor. As a great worker, Adam has achieved Contractor of the Month for June 2000.

RON SUTLIFF

Ron is responsible for government reporting functions, including funding reports, ODC reports, 533s, pool reporting and branch resource reports on the Sverdup wind tunnel contract. Ron has been with Sverdrup since the initial phase-in of their contract in December of 1998. He has taken a system with no reporting mechanism to a first rate system with effective reports for both NASA and Sverdrup use. During the most recent months, Ron has spent considerable time reconciling all the report bottom lines to account every dollar on this contract. He has spent countless hours examining the data to insure the highest possible standard of data integrity. He researches small data inconsistencies to determine the root cause and then proceeds to take action to eliminate the originating problem rather than simply correcting the erroneous data. Ron's reporting expertise is demonstrated in a recent overtime report whereby NASA and Sverdrup supervisors can effectively understand and control the overtime usage on the contract. The report is produced weekly to facilitate, budget, and control overtime use on a real-time basis. The end result increased management insight with a significant decrease in the number of overtime hours used in support of NASA Wind Tunnels. Ron's dedication to the contract reporting is unsurpassed. He is prepared to stay until the task is finished, even if that means sacrifice of his own personal time and schedule. He understands the importance of customer relations and facilitating the needs of the customer. Ron is an extremely valuable asset to Sverdrup Technology and ultimately to NASA. Mr. Sutliff has been awarded Employee of the Month of June 2000.

Employee of the Month Awards



IRA CHANDLER

Ira Chandler is much appreciated for his exemplary job while working on the Unsteady Areo Test. As usual, Ira always displayes a positive attitude and gets the job done. He works quietly and efficiently doing whatever it takes to keep the test on track. If you don't pay attention, you don't realize how much work he does. He shifts his hours so that no over time would be accrued, fills gaps in testing by working on R-cal boxes at the lab and learned the NIDS system. He is always willing to tackle any task we needed to accomplish. The instrumentation was always checked out and ready to go, and he adeptly handled the NIDS data system as well without incident during the test. Whenever he wasn't needed for the test (because of a drive system or problem), he would be building up instrumentation hardware for another test or facility. Finally Ira and Mike Simmundich were always willing to shift their schedule so that we could reserve our scarce contractor overtime budget. That really helps out our organization, and it's a good example of their team spirit. Being flexible and willing to tackle any job is a real help to complete our scheduled tests successfully.

JOE SACCO

Mr. Sacco is recommended as Employee of the Month for his outstanding contributions to the successful completion of the NREL Unsteady Aerodynamics test conducted in the 80 X 120 Wind Tunnel. Joe took over this test while it was in progress due to a reassignment of a test engineer to another project. With little previous involvement with this test program, Joe stepped forward to fill the void and did an outstanding job in guaranteeing the success of the test. In addition, Joe continued to act as NFAC facility manager. He coordinated all of the activities of NFAC by coming in early before assuming the test manager duties on swing shift. Joe Sacco well deserves Employee of the Month as Civil Servant for May 2000.

GAYLE FRANK

Gayle Frank has done an outstanding job in furthering the quality of our safety program contract. Her attitude and initiative are exemplary. The "Safety Lines" newsletter that she publishes has received praise from across the Center, which enhances the reputation of the FO Division as a leader in safety. Gayle Frank unquestionably wins Contractor of the Month Award for July 2000.